

IN THE CLAIMS:

1. A method related to a communication between a radio network and a wireless subscriber unit over a radio link, comprising:

determining a quality of service (QoS) profile for the communication with the subscriber unit over the radio link that includes one or more desired QoS parameters with at least a first desired QoS parameter;

determining for the communication with the subscriber unit a first actual QoS parameter; and

determining whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship; and

selecting or adjusting a modulation and coding scheme (MCS) for transmitting information over the radio link based on whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship.

2. The method in claim 1, further comprising:

combining the first and second desired QoS parameters into a combined desired QoS parameter, and

combining the first and second actual QoS parameters into a combined actual QoS parameter,

wherein the selecting or adjusting selects or adjusts the MCS based on whether the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

3. The method in claim 2, further comprising:

selecting or adjusting the modulation and coding scheme (MCS) for transmitting information over the radio communications link based on whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship and whether the second desired QoS

parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship.

4. The method in claim 2, wherein the first QoS parameter is bit rate and the second QoS parameter is delay.

5. The method in claim 1, further comprising:
determining the MCS to provide a greatest throughput over the radio link shared by multiple wireless subscriber units where the first actual QoS parameter and the first desired QoS parameter are within an acceptable range or an acceptable relationship.

6. The method in claim 1, further comprising:
detecting a change in the QoS profile, and
repeating the steps in claim 1.

7. The method in claim 1, wherein the selected or adjusted MCS is a first MCS, the method further comprising:
detecting a first request for retransmission of a data unit, and
determining a second MCS for retransmitting the data unit over the radio communications link.

8. The method in claim 7, further comprising:
detecting a second request for retransmission of the data unit, and
determining a third MCS for retransmitting the data unit over the radio communications link.

9. The method in claim 1, wherein the first desired QoS parameter is delay, the method further comprising:
adapting the MCS to ensure that an error rate for communications over the radio communications link does not cause the actual delay to exceed a threshold value.

10. The method in claim 9, wherein the delay is a delay on a radio link control protocol level.

11. The method in claim 9, wherein the delay is a delay on a logical link layer control protocol level.

12. The method in claim 9, wherein the MCS is adapted incrementally.

13. The method in claim 1, wherein the MCS is selected or adjusted for transmitting information over the radio link from the radio network to the wireless subscriber unit.

14. The method in claim 1, wherein the MCS is selected or adjusted for transmitting information over the radio link from the wireless subscriber unit to the radio network.

15. A method related to a communication between a radio network and a wireless subscriber unit over a radio link, comprising:

determining a quality of service (QoS) profile for the communication with the subscriber unit over the radio link that includes a first desired QoS parameter and a second desired QoS parameter;

determining a combined desired QoS parameter using the first desired QoS parameter and the second desired QoS parameter;

determining for the communication with the subscriber unit a first actual QoS parameter and a second actual QoS parameter;

determining a combined actual QoS parameter using the first actual QoS parameter and the second actual QoS parameter; and

determining whether the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship; and

selecting or adjusting a modulation and coding scheme (MCS) for transmitting information over the radio link based on whether the combined desired

QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

16. The method in claim 15, wherein the first and second QoS parameters correspond to a guaranteed bit rate and a maximum transfer delay.

17. The method in claim 15, further comprising:
determining the MCS to provide a greatest throughput over the radio link shared by multiple wireless subscriber units assuming the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

18. The method in claim 15, further comprising:
detecting a change in the QoS profile, and
repeating the steps in claim 15.

19. The method in claim 15, wherein the MCS is selected or adjusted for transmitting information over the radio link from the radio network to the wireless subscriber unit.

20. The method in claim 15, wherein the MCS is selected or adjusted for transmitting information over the radio link from the wireless subscriber unit to the radio network.

21. Apparatus for use in a communication between a radio network and a wireless subscriber unit over a radio link, comprising:

means for determining a quality of service (QoS) profile for the communication that includes a first actual QoS parameter and a second desired QoS parameter;

means for determining for the communication a first actual QoS parameter and a second actual QoS parameter; and

means for determining whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship;

means for determining whether the second desired QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship; and

means for selecting or adjusting a modulation and coding scheme (MCS) for transmitting information over the radio link based on whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship or whether the second actual QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship.

22. The apparatus in claim 21, further comprising:

means for combining the first and second desired QoS parameters into a combined desired QoS parameter, and

means for combining the first and second actual QoS parameters into a combined actual QoS parameters,

wherein the means for selecting or adjusting selects or adjusts the MCS based on whether the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

23. The apparatus in claim 22, wherein the first QoS parameter is a guaranteed bit rate and the second QoS parameter is maximum transfer delay.

24. The apparatus in claim 21, further comprising:

means for determining the MCS to provide a greatest throughput over the radio communications link where the first and second actual QoS parameters and the first and second desired QoS parameters, respectively, are within an acceptable range or an acceptable relationship.

25. The apparatus in claim 21, wherein the MCS is selected or adjusted for transmitting information over the radio link from the radio network to the wireless subscriber unit.

26. The apparatus in claim 21, wherein the MCS is selected or adjusted for transmitting information over the radio link from the wireless subscriber unit to the radio network.

27. A mobile station for use in a communication between a radio network and the mobile station over a radio link, comprising:

- a coder for coding information to be transmitted;

- a modulator for modulating the coded information;

- a transceiver for transmitting the modulated information;

- a controller for determining for the communication a first desired QoS parameter and a second desired QoS parameter; and

- a QoS detector for determining for the communication a first actual QoS parameter and a second actual QoS parameter,

wherein the controller is configured to:

- determine whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship;

- determine whether the second desired QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship; and

- select or adjust a modulation scheme implemented in the modulator or a coding scheme implemented in the coder for transmitting information over the radio link based on whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship or whether the second desired QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship.

28. The mobile station in claim 27, further comprising:

a combiner for combining the first and second desired QoS parameters into a combined desired QoS parameter and for combining the first and second actual QoS parameters into a combined actual QoS parameter,

wherein the controller is configured to select or adjust the modulator or the coder based on whether the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

29. The mobile station in claim 28, wherein the first QoS parameter is bit rate and the second QoS parameter is transmission delay.

30. The mobile station in claim 27, wherein the controller is configured to determine the MCS to provide a greatest throughput over the radio communications link where the first and second actual QoS parameters and the first and second desired QoS parameters, respectively, are within an acceptable range or an acceptable relationship.

31. Radio network apparatus for use in a communication between a radio network and the mobile station over a radio link, comprising:

- a coder for coding information to be transmitted;

- a modulator for modulating the coded information;

- a transceiver for transmitting the modulated information;

- a QoS detector for determining for the communication a first actual QoS parameter and a second actual QoS parameter;

- a first controller for determining for the communication a first desired QoS parameter and a second desired QoS parameter, determining whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship, and determining whether the second desired QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship; and

a second controller for selecting or adjusting a modulation scheme implemented in the modulator or a coding scheme implemented in the coder for transmitting information over the radio link based on whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship or whether the second desired QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship.

32. The radio network apparatus in claim 31, wherein the first and second QoS parameters correspond to bit rate and transmission delay.

33. The radio network apparatus in claim 31, further comprising:

a combiner for combining the first and second desired QoS parameters into a combined desired QoS parameter and for combining the first and second actual QoS parameters into a combined actual QoS parameter,

wherein the first controller or second controller is configured to select or adjust the modulator or the coder based on whether the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

34. The radio network apparatus in claim 31, wherein the first controller is configured to determine the MCS to provide a greatest throughput over the radio communications link where the first and second actual QoS parameters the first and second desired QoS parameters, respectively, are within an acceptable range or an acceptable relationship.

35. The radio network apparatus in claim 34, wherein the decision whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship is made in the radio network.

36. The radio network apparatus in claim 34, wherein the decision whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship is made in the mobile station.

37. The radio network apparatus in claim 34, further comprising:
a combiner for combining the first actual QoS parameter and a second actual QoS parameter into a combined actual QoS parameter,

wherein the controller is configured to select or adjust the modulator or the coder based on whether the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

38. The radio network apparatus in claim 37, wherein the first QoS parameter is bit rate and the second QoS parameter is transmission delay.

39. The radio network apparatus in claim 34, wherein the MCS is selected or adjusted to provide a greatest throughput over the radio communications link when the first actual QoS parameter and the first desired QoS parameter are within an acceptable range or an acceptable relationship.

40. The radio network apparatus in claim 34, wherein the radio network apparatus is implemented partially in a radio base station and partially in a radio base station controller.

41. The radio network apparatus in claim 34, wherein the radio network apparatus is implemented in a radio base station.

42. Radio network apparatus for use in a communication between a radio network and the mobile station over a radio link, comprising:

a coder for coding information to be transmitted;

a modulator for modulating the coded information;

a transceiver for transmitting the modulated information;

a QoS detector for determining for the communication a first actual QoS parameter;

a first controller for determining for the communication a first desired QoS parameter and whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship; and

a second controller for selecting or adjusting a modulation scheme implemented in the modulator or a coding scheme implemented in the coder for transmitting information over the radio link based on whether the first desired QoS parameter and the first actual QoS parameter are within an acceptable range or an acceptable relationship.

43. The radio network apparatus in claim 42, wherein

the QoS detector is configured to determine a second actual QoS parameter, the first controller is configured to determine for the communication a second desired QoS parameter and to determine whether the second desired QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship, and

the second controller is configured to further select or adjust the modulation scheme implemented in the modulator or the coding scheme implemented in the coder for transmitting information over the radio link based on whether the second desired QoS parameter and the second actual QoS parameter are within an acceptable range or an acceptable relationship

44. The radio network apparatus in claim 43, wherein the first and second QoS parameters correspond to bit rate and transmission delay.

45. The radio network apparatus in claim 42, wherein the QoS detector is configured to determine a second actual QoS parameter, the first controller is configured to determine a second desired QoS parameter, further comprising:

a combiner for combining the first and second desired QoS parameters into a combined desired QoS parameter and for combining the first and second actual QoS parameters into a combined actual QoS parameter,

wherein the first controller or second controller is configured to select or adjust the modulator or the coder based on whether the combined desired QoS parameter and the combined actual QoS parameter are within an acceptable range or an acceptable relationship.

46. The radio network apparatus in claim 42, wherein the first controller is configured to determine the MCS to provide a greatest throughput over the radio communications link where the first actual QoS parameter and the first desired QoS parameter are within an acceptable range or an acceptable relationship.

47. The radio network apparatus in claim 42, wherein the coder, modulator, transceiver, and quality detector are in a radio base station and the first and second controllers are in a radio network controller coupled to the radio base station.

48. The radio network apparatus in claim 42, wherein the coder, modulator, transceiver, quality detector, and second controller are in a radio base station and the first controller is in a radio network controller coupled to the radio base station.

49. The radio network apparatus in claim 42, wherein the coder, modulator, transceiver, quality detector, the first controller, and the second controller are in a radio base station.